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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/694,774	10/24/2000	Edson Jose Joaquim De Souza	Q61420	7442
7590	12/28/2004		EXAMINER DOROSHENK, ALEXA A	
SUGHRUE, MION, ZINN, MACPEAK & SEAS 2100 Pennsylvania Avenue, N.W. Washington, DC 20037			ART UNIT 1764	PAPER NUMBER

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/694,774	DE SOUZA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Alexa A. Doroshenk	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### **Status**

1) Responsive to communication(s) filed on 07 October 2004.  
 2a) This action is **FINAL**.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### **Disposition of Claims**

4) Claim(s) 1-38 is/are pending in the application.  
 4a) Of the above claim(s) 27 is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-26 and 28-38 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### **Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 07 October 2004 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### **Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### **Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

## DETAILED ACTION

### ***Election/Restrictions***

1. Newly submitted claim 27 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Claim 27 is a method of atomizing a hydrocarbon feed which does not require the particulars of the apparatus claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 27 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Drawings***

2. The drawings were received on October 7, 2004. These drawings are acceptable.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-26 and 28-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "the discharge zones" in line 17 of the claim. There is insufficient antecedent basis for this limitation in the claim. The examiner suggests that applicant deleted the word "the" in order to overcome this rejection.

Claim 1 recites a mixing chamber in line 11 of the claim, and then again recites "a mixing chamber" in line 17 of the claim. Since applicant only discloses one mixing chamber in their apparatus, it is suggested that applicant amend the mixing chamber recitation at line 17 to state "the mixing chamber".

Claim 16 recites that the angle  $\alpha$  is a function of the number of nozzles. This is unclear as such a function or relationship has not been defined in the specification. Since a relationship has only been stated as existing and not defined, the scope of this claim cannot be determined.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-15, 17-19, 23, 27-33 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Newton (6,088,934).

With respect to claim 1, Newton discloses a feed injector (1) made up of two conduits, an inner conduit (2) where atomizing fluid is introduced and an outer conduit (3) where liquid feed is introduced;

the injector (1) further comprising nozzles arranged in rows, a central nozzle (not numbered) is connected at one end to the inner conduit (2) and connected to a mixing chamber (4) at the other end, and side nozzles (not numbered) connected at one end to the outer conduit (3) and connected to a mixing chamber (4) at the other end;

the nozzles are placed so that the energy of the atomization fluid (2) is transferred to the flow of liquid feed (3).

Claims 2-6 and 38 continue to read on the apparatus of Newton since the material worked upon does not limit apparatus claims. MPEP 2115.

With respect to claims 7 and 8, there are at least two side nozzles for each central nozzle (see figure 2).

With respect to claim 9, there are between 1 and 12 nozzles (see figure 2).

With respect to claim 10, there is an axis of symmetry of the central nozzle which is parallel to an axis of symmetry of the conduits.

With respect to claim 11, there is an axis of symmetry of the central nozzle which is not parallel to an axis of symmetry of the conduits.

With respect to claim 12, there is an axis of symmetry of the side nozzles which is not parallel to an axis of symmetry of the conduits.

With respect to claim 13, the mixing chamber (4) is the locus formed by the free surfaces downstream of each contact point of atomization fluid and feed.

With respect to claim 14, it can be seen in figure 2 of Newton that the ratio between the length and width of the mixing chamber (4) is between 0.5 and 20.

With respect to claim 15, 17, 18, 32 and 33 it can be seen in figure 2 that an angle can be measured from the nozzles and that the angle is between zero to 20°, 10° to 60°, as well as 1° to 12°.

With respect to claim 19, it can be seen in the figures that the central nozzle is cylindrical.

With respect to claim 23, it can be seen in the figures that the side nozzle is cylindrical.

With respect to claims 28 and 29, the number of nozzles is between both 4 and 9 as well as 3 and 7 (see figure 2).

With respect to claims 30 and 31, it can be seen in figure 2 of Newton that the ratio between the length and width of the mixing chamber (4) is between 1 to 10 as well as 2 to 7.

#### ***Claim Rejections - 35 USC § 103***

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
8. Claims 20-22, 24, 26 and 34-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Newton (6,088,934) as applied above, and further in view of Williatte et al. (5,037,616).

With respect to claims 20, 21, 24, 25 Newton only illustrates wherein the shape of the central and side nozzles are cylindrical and does not disclose a convergent/divergent (venturi) shape.

Williatte discloses a nozzle for feed injection into an FCC reactor riser and teaches the use of a venturi (both converging and diverging forms are in a venturi) in order to achieve atomization of the feed (col. 4, lines 5-39). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a venturi shape as a form for the nozzles of Newton in order to further ensure atomization of the fluids.

With respect to claim 22, it can be seen in figure 1 of Williatte et al. that the converging angles are between 30° and 120° while the diverging section has an angle from zero to 90°.

With respect to claims 34 and 35, it can be seen in figure 1 of Williatte et al. that the converging angles are between 40° and 90° as well as 50° and 80°.

With respect to claims 36 and 37, it can be seen in figure 1 of Williatte et al. that the diverging section has an angle from 5° to 30° as well as 6° to 14°.

9. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Newton (6,088,934) in view of Chen (6,387,247) and Steffens et al. (5,173,175).

Newton discloses an atomization injection means (1) and wherein it can be used in a fluidized bed reactor, but does not specifically disclose where it can be used in an FCC reactor.

Chen discloses wherein an FCC reactor uses atomizing feed nozzles and wherein the number of atomizing feed nozzle assemblies (100) coupled to a FCC riser reactor can be any reasonable number (preferably 1 to 6) (col. 4, line 66- col. 5, line 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the nozzles of Newton as the atomizing in the FCC reactor of Chen in order to provide nozzles which allow for the droplet size of the liquid to be controlled (col. 4, lines 66-67 of Newton) and since it is merely the substitution of equivalent mixing nozzles with a reasonable expectation of success.

Chen is silent as to having the nozzles at an angle.

Steffens et al. discloses a feed nozzle for the riser of an FCC reactor and teaches that "in a typical unit, the feed injector may discharge at an angle to the riser of between 0° and 75°" (col. 5, lines 43-49). It would have been obvious to one of ordinary skill in the art at the time the invention was made to angle the feed assemblies of Chen as it well known in the art that feed injection nozzle assemblies are angled when feeding to a FCC reaction riser.

### ***Response to Arguments***

#### **Specification**

The objections to the specification are withdrawn due to applicant's amendments. The examiner would also like to thank applicant for again providing a copy of page 14 of the application.

Drawings

The objection to the drawings are withdrawn due to applicant's amendments.

35 USC 112, second paragraph

The rejection of Claim 1 under 35 USC 112, second paragraph due to "geometrically placed..." is withdrawn due to applicant's arguments.

The rejection of Claim 27 under 35 USC 112, second paragraph is withdrawn since applicant has amended the claim to be a method claim. It is noted that the claim has been withdrawn from consideration as presented above.

The remaining rejections of claims 1 and 16 are maintained and presented above.

The lack of antecedent basis for "the discharge zones" in Claim 1 is not for lack of antecedent basis in the specification, but within the claim itself. It is suggested that applicant change this to remove "the" to overcome the rejection.

Claim 16 is still unclear as to how the angle  $\alpha$  is a function of the number of nozzles. Though this exact statement can be found in the specification, this relationship is still not defined. Since a relationship has only been stated as existing and not defined, the scope of this claim cannot be determined. How do the number of nozzles affect the angle  $\alpha$ ?

35 USC 101

The rejection of Claim 27 under 35 USC 101 is withdrawn since applicant has amended the claim to be a method claim. It is noted that the claim has been withdrawn from consideration as presented above.

35 USC 102/103

Applicant has successfully amended claim 1 to overcome the rejections over Chen et al. '857 as well as Chen et al. '247. Therefor, new grounds have been set forth above.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexa A. Doroshenk whose telephone number is 571-272-1446. The examiner can normally be reached on Monday - Thursday from 9:00 AM - 7:30 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Calderola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Alexa A. Doroshenk  
Examiner  
Art Unit 1764